data available thus far, CICR has proposed some important resistance management strategies to the GEAC. The strategies place emphasis on reducing populations of *H. armigera* that survive Bt. cotton and enhancement of area of alternate host crop that are as attractive as cotton to *H. armigera,* to be used as trap crop or intercrop refuges. If proper pest management measures are followed to ensure that at least 90% of the surviving larvae of the American bollworms in Bt-cotton fields, are killed with biopesticides, resistance can be delayed to 45 years even with 40% area under Bt-cotton. The following strategies have been proposed to the GEAC for approval and implementations so as to ensure that resistance is delayed for a much longer time. The strategies, that would enable extending the usefulness of Bt technology would be:—

(i) Use eco-friendly methods such as cultural control or hand-picking of surviving bollworms in Bt cotton fields. Deep-ploughing of fields immediately after Bt-cotton harvest to destroy resistant pupae.

(ii) Biopesticides that are neem based or HaNPV (virus) were found to be more effective on larvae surviving on Bt-cotton because of their slower growth as compared to those on the conventional non-Bt cotton. Hence these would be useful to manage younger larvae on 60-90 days old crop. Alternatively, eco-friendly insecticides such as spinosad, emamectin benzoate, novaluron or Indoxacarb can be used on 90 and 120 days old crop to reduce populations of resistant inset genotypes.

(iii) Use of attractive synchronous alternate host crops such as marigold, sunflower, chillies etc. for *H. armigera* which could be used as intercrop or trap crop refuges.

(iv) Use alternate genes that do not share common resistance mechanisms as that of Cry1Ac, in transgenic plants either in rotation or alternation or mixtures such as the dual-gene based Bt-cotton varieties.

Sale of Spurious Bt. Cotton seeds

491. SHRI EKANATH K. THAKUR: Will the Minister of AGRICULTURE be pleased to state:

(a) whether it is a fact that spurious seeds of Bt. Cotton have flooded the markets of Gujarat, Maharashtra, Karnataka, Andhra Pradesh, Madhya Pradesh and other cotton growing areas of the country; and

(b) if so, the steps Government propose to take to check the sale of spurious Bt. Cotton seeds?

THE MINISTER OF STATE IN THE MINSTRY OF AGRICULTURE (DR. AKHILESH PRASAD SINGH): (a) and (b) There have been certain reports of production and supply of spurious Bt. Cotton seeds in some states particularly, in Andhra Pradesh, Gujarat and Tamil Nadu. The Government of India has advised in 2004 to all the Bt. Cotton growing States to take necessary punitive action against the producers and venders of illegal Bt. Cotton seeds under the provisions of Environment (Protection) Act, 1986 and Seed. (Control) Order, 1983. Department has again instructed Bt. Cotton growing States in 2005 reiterating its earlier stand and requested to create awareness amongst the farmers through awareness campaign regarding the potential risks associated with illegal Bt. Cotton seeds.

The Genetic Engineering Approval Committee (GEAC) have also advised all the Bt. Cotton growing States from time to time to take punitive action producers, suppliers and venders of spurious Bt. Cotton seeds under the provision of Environment (Protection) Act, 1986 and Seed Legislations. Besides, the Central Institute for Cotton Research, Nagpur has been notified as referral lab for detecting the presence/absence of Bt. Gene. As per information made available by the Department of Seed Certification, Tamil Nadu, a laboratory has been established in the Directorate of Seed Certification, Coimbatore to test Cotton seed to analyze whether it contains illegal Bt.Gene. It has been intimated by the Government of Punjab, where Bt. Cotton varieties have been approved for cultivation during Kharif-2005, that they have issued strict instructions to all field functionaries to check and stop sale of any spurious seeds. They have also undertaken massive campaigns for educating farmers on the issue.

The Government of Gujarat has constituted Special Flying Squad to prevent spreading of illegal Bt. Cotton seeds. Press Notes have been published in Newspapers by Government of Gujarat to create awareness amongst farmers regarding use of authorized Bt. Cotton seeds.

The Governemnt of Andhra Pradesh has informed that to regulate the supply and sale of illegal and unabelled Bt. Cotton seeds in the market during Kharif-2005, necessary regulatory steps have been taken. The

Department of Agriculture has constituted Special Squads raid the premises of seed producers, processing plants and packing units, which in June, 2005 has seized 272.53 Qtls, of Bt. Cotton spurious seeds and 49 persons were arrested under Section IPC 420. Stop sale notices were issued for detention of stocks of Bt. Cotton hybrids NCS-145 in the state because of complaints about poor germination.

The Governemnt of Karnataka has also noticed sporadic cases of spurious Bt. Cotton seeds in the State. In order to curb the illegal Bt. Cotton seeds in the State, the Department of Agriculture has constituted Task Force to take up surprise visits to all the Seed Dealers as well as premises of Seed Producing Agencies for drawing the seed samples for quality analysis. The Department has also seized 1100 packets of fake Bt. Seeds and spurious Bt. Cotton seed supplier has been arrested and a case filed against him.

Shortfall in agricultural growth

492. SHRI C. RAMCHANDRAIAH:
SHRI MANOJ BHATTACHARYA:

Will the Minister of AGRICULTURE be pleased to state:

(a) whether these has been a shorfall in agricultural growth in the country during Eighth and Ninth Plans and the three years of the Tenth Five Year Plan:

(b) if so, the details thereof:

(c) whether mid-term appraisal of the Tenth Five year Plan has also expressed concern on the stagnated rate of agricultural growth; and

(d) if so the action proposed by Government to boosts up the growth rate in the agriculture sector?

THE MINISTER OF STATE IN THE MINISTRY OF AGRICULTURE (DR. AKHILESH PRASAD SINGH): (a) and (b) The annual average growth rates of agriculture including the allied sectors of forestry, logging and fishing during the Eighth and Ninth Five Plans, and the first three years of the Tenth Five year Plan are shown below:—

Eighth Plan: 4.7% against the targeted growth rate of 3.1%
Ninth Plan: 2.1% against the targeted growth rate of 3.9%
First three years of the Tenth Plan: 1.2% against the targeted growth rate of 4.0%